

It is safe to predict that the new journal will be of increasing interest to all botanists, and more particularly so to ecologists who see in forestry the practical application of their more theoretical studies.—GEO. D. FULLER.

Endemism and the mutation theory.—WILLIS, in papers previously reviewed in this journal,²⁹ working upon the flora of Ceylon, has proposed the theory that relative endemism is determined by relative age, the youngest species being the endemics. RIDLEY³⁰ points out that WILLIS has based his arguments upon statistics gathered from herbarium specimens; and illustrates that such will not agree with field statistics, the commonest species sometimes being poorly represented in the herbarium. In connection with his theory WILLIS states that "very common" plants could not disappear without a geological catastrophe. This RIDLEY has shown to be inaccurate, illustrating from his own personal experience and from well known historical evidence that common species have disappeared within a few years, due to parasites, the activities of man, and relatively slight climatic changes. RIDLEY claims that the Ceylon endemics are relics, since there are no other local species from which they could have been evolved recently.

The remainder of the paper is a criticism of the mutation theory as used by WILLIS to explain the origin of the Ceylon flora. RIDLEY's arguments and evidence are of the characteristic Neo-Darwinian type. As an attack upon the mutation theory, or WILLIS' application of it, the paper is unconvincing to the reviewer.—MERLE C. COULTER.

Heath and grassland.—FARROW³¹ has described an interesting area of Norfolk and Suffolk Counties, England, where upon sandy soil with only 22.5 inches of annual rainfall there develops a transition from a heath dominated by *Calluna vulgaris* to a grassland with a short close turf in which *Festuca ovina* and *Agrostis vulgaris* are the most abundant species. The sterility of the soil is such that some has never been cultivated and much of the rest once farmed has long since been abandoned. The grassland seems to present the nearest approach to continental steppe conditions to be found in Great Britain.

In the second of his papers the author finds that the chief factor in the invasion of the heath by the grassland is the destruction of the *Calluna vulgaris* by an overpopulation of rabbits. Once the *Calluna* becomes weakened by its leaves being eaten by the rabbits, a luxuriant growth of *Cladonia* appears to be able to smother it and to hasten its death. In the absence of rabbits

²⁹ Rev. in BOT. GAZ. 61:82. 1916; 62:160. 1916; 63:419. 1917.

³⁰ RIDLEY, H. H., On endemism and the mutation theory. Ann. Botany 30:551-574. 1916.

³¹ FARROW, E. P., On the ecology of the vegetation of Breckland. I. General description of Breckland and its vegetation. Jour. Ecology 3:211-228. 1915; II. Factors relating to the relative distribution of *Calluna* heath and grass heath in Breckland. Jour. Ecology 4:57-64. 1916.

the *Calluna* maintains its dominance over both the grasses and the lichens.—
GEO. D. FULLER.

The variable desert.—Writing in semipopular language, HARRIS³² has described the wide variation of climatic and other factors influencing plant life in the desert region of Tucson, Arizona, in such a way as to give a more graphic and living picture of this most interesting region than will be found in other more voluminous and technical reports. The wide variation of precipitation from year to year and from month to month is made clear by a diagram, while the large proportion of waste of the scanty water supply is emphasized. The wide range of temperature during both the year and the day, the almost infinite variety of plant forms, extending from thin to thick-leaved herbs, from broad-leaved to leafless shrubs, and from succulent to woody plants with varied aspect at different seasons of the year, are all clearly depicted. In a word, the reader is made to appreciate some of the complexity of environment and diversity of organisms which have rendered this region so fascinating to the intelligent layman and to the investigating scientist.—GEO. D. FULLER.

Ecology of lichens.—In connection with a systematic study of the lichen flora of South Lancashire, WHELDON and TRAVIS³³ discuss some of the factors detrimental to the growth of these plants. Particular attention is directed to their sensitiveness to pollution of the atmosphere by the smoke and chemical fumes attendant upon the development of a manufacturing industry. The observations are of a general rather than of a particular character and are not accompanied by any experimental data. They also note that a calcareous substratum seems to counteract the effect of smoke upon the lichens. The selective action of these plants is well illustrated by the group of species peculiar to the carboniferous limestone.—GEO. D. FULLER.

Tolerance of trees.—After making studies of light in the forests of Michigan and Vermont and its effect upon the growth, BURNS³⁴ concludes that "tolerance" used to express a light relationship should no longer be used in reference to the development of tree seedlings. He found the filtered light in the forest of little value in the decomposition of carbon dioxide compared with the weakened white light. What is usually regarded as a light relationship is really the total relationship of a tree to all factors of the habitat. He further concludes that light readings in the forest are of little value.—GEO. D. FULLER.

³² HARRIS, J. ARTHUR, The variable desert. *Scientific Monthly* 3:41-49. 1916.

³³ WHELDON, J. A., and TRAVIS, W. G., The lichens of South Lancashire. *Jour. Linn. Soc.* 43:87-136. 1915.

³⁴ BURNS, G. P., Studies in tolerance of New England forest trees. III. Discontinuous light in forests. *Vt. Agric. Exp. Sta. Bull.* 193. pp. 23. 1916.